Request for Proposals
by
The Appalachian Regional Commission
for
Industry Structure and Company Strategies of
Major Domestic and Foreign Wind and Solar Energy Manufacturers:
Opportunities for Supply Chain Development in Appalachia

Appalachian Regional Commission
1666 Connecticut Ave., NW
Washington, D.C. 20009-1068

August 3, 2007

Proposals due on or before August 28, 2007

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I. Overview: The Appalachian Regional Commission (ARC) invites proposals from qualified researchers and consultants to assess the competitive market potential for supply chain development of Appalachian-based manufacturers in key segments of the solar and wind energy product markets. The ARC is a federal-state partnership established in 1965 to promote social development and economic competitiveness of the Appalachian Region and to bring the Region closer to parity with rest of the nation. [1] In 2006 ARC adopted a Regional Energy Blueprint *Energizing Appalachia* which set forth as its second strategic goal to increase the use of renewable energy resources and job creation opportunities in these sectors in Appalachia. The Commission's purpose in conducting this research is to identify the best regional job growth opportunities in these renewable energy sectors, including assessing potential supplier chain linkages between existing regional manufacturers and major domestic and international vendors; and to explore clustering of value-added activities in these sectors within the Region.

II. Scope of Work

This research project will analyze the competitive position of regional manufacturers' industrial capacity to supply key components and product market segments in the wind and solar energy markets, and major corporate vendors' sourcing strategies and criteria for meeting current and future market demand. The specific topics that should be included in the proposal are:

1. Review and assess the recent studies of the market potential of regionally based manufacturers to compete for supply chain sourcing in relevant wind and solar component and product markets for industrial, commercial and residential applications including: 1) solar photovoltaic cells, silicon and non-silicon based solar materials, flat plates and panels, related equipment and systems for electrical generation; solar concentrating systems for electrical generation; integrated photovoltaic building modules such as roofs, shingles, shades, etc.; remote power systems and emerging distributed grid-connected markets; and solar thermal energy technologies; 2) large wind turbine installations and components, and medium and small turbine systems and components.
2. Analyze the vertical and horizontal market structure in the solar and wind energy product markets, capacity utilization, and supply constraints; and, corporate strategies of major equipment producers in these markets, as well as supplier chain developments, including trends in foreign direct investments by major international firms.

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[1] For a current listing of the economic designations of the 410 Appalachian counties see: http://www.arc.gov/index.do?nodeId=58.

3. Analyze domestic and international market forecasts for existing and emerging technologies, and consensus views about the risks associated with these forecasts.
4. Analyze the industrial distribution and concentration of manufacturing activities of Appalachian-based firms either participating in these products markets or possessing the relevant industrial capacity to participate in them.
5. Review the current policy landscape in the Appalachian Region and the public incentives to attract, develop and retain businesses in these markets.
6. Assess the competitive position of the Region's manufacturing base to participate in these markets, including the clustering of activity, and provide a range of estimates of the potential economic impact based on investment scenarios and forecasts.

The reports should be written for a non-technical audience and fully relate the narrative to all descriptive statistics, analyses, graphs and tables.

Deliverables

The contract will require a draft and final report with an executive summary, although the report may be organized into two separate volumes. The project will be deemed complete upon receipt of a hard copy of the report suitable for photocopying, an electronic version, and an electronic data base (in an agreed upon software format) with a complete data dictionary.

III. Methodology

The successful applicant will develop a complete methodology to analyze the topics specified in the scope of work.

The methodology should include:

- A topical outline for the review of the relevant literature and research on wind and solar energy industry segments and major company strategies;
- Specification of data sets for an analysis of the international, national, and regional industry and company trends, with public or proprietary data sources identified;
- Methods for the analysis of the industries, markets and company trends, forecasts and competitive dynamics, as well as the geographic distribution of regional firms by industry;
- Discussion of methods to assess the potential impact of supply-chain expansion either through formal impact modeling and/or semi-structured interviews with key trade associations, and company officials outside and within the Region.

Proposals may offer other methodological procedures as needed and consider various tradeoffs among methods subject to budget constraints.

IV. Cost and Timing

The Commission rates this research project as a Medium-scale research project according to ARC's rating of the level of effort for conducting research: Major research projects $250k-$300k+; Large–scale $150 to $249k; Medium–scale $75k to $149K; Small–scale $25k to $74k; Research Brief less than $25k.

The contract will be a FIRM FIXED-PRICE CONTRACT. The Commission anticipates that the research will take 10 months to one year to complete.

Overhead Policy

The Appalachian Regional Commission's policy on allowable indirect overhead costs for university-based research has been to permit universities to charge the same rates charged to their own state agencies. For the purposes of the project under current discussion, an indirect overhead of 15 percent would be in keeping with research contracts of this size.

V. Evaluation of Proposals

All proposals will be evaluated based on the following criteria:

- Clear and complete understanding of the study objectives and tasks;
- Command of existing energy industry analyses and energy policy;
- Complete, clearly articulated, logical study design and technically competent methodology;
- Demonstrated ability to synthesize and interpret research findings in a credible and useful manner;
- Qualifications, relevant prior experience, and capability to carry out and support the project in a timely fashion;
- A credible management proposal;
- The cost-effectiveness of the proposed project design.

VI. Proposal Submission

An original and three copies of the proposal must be submitted to the States Washington Office, Appalachian Regional Commission, 1666 Connecticut Avenue, NW, Suite 700, Washington, D.C., 20009-1068, on or before **August 28, 2007**. For information contact Greg Bischak by phone at (202) 884-7790 or by e-mail at gbischak@arc.gov.

VII. Background on Appalachia's Energy Production and Consumption:

As Table 1 and Figure 1 below illustrate that Appalachia's energy consumption and production base has very little solar and wind capacity. As Table 1 shows, Appalachia's relatively high share of coal and nuclear electric energy consumption reflects the use of these fuel sources to generate electricity for local consumption and to export to surrounding states. It is noteworthy that the Region's share of high-cost natural gas is lower than the nation's, while its share of "other sources," which is largely made up of renewable energy sources, is lower than the nation's, even though the Region possesses considerable potential in renewable energy sources, particularly in biomass and wind.

Table 1

United States and Appalachian
Energy Consumption Estimates by Source, 2002

	United States		Appalachia	
	Trillion BTUs*	Share	Trillion BTUs*	Share
Coal	21,903	22%	3,532	38%
Natural Gas	23,806	24%	1,415	15%
Petroleum	38,400	39%	2,840	31%
Nuclear Electric	8,143	8%	1,020	11%
Hydroelectric	2,689	3%	160	2%
Biomass	2,571	3%	317	3%
Other	570	1%	4	0%
Total (excluding losses)	98,082	100%	9,287	100%

**British Thermal Units (BTUs) refers to a standardized measure of energy content.*
Source: Energy Information Administration, 2006; Appalachian estimates prepared by ARC based on EIA state-level data.

Appalachia's electrical generation capacity and output is far more dependent on coal than the nation's. As Figure 1 shows, more than three-quarters of the Region's electrical output is derived from coal, and 16.5 percent is derived from nuclear power, while gas and oil together contribute about 3 percent. By contrast, the nation as a whole generates half its electricity from coal, 20 percent from nuclear power, and more than 21 percent from gas- and oil-fired power plants.

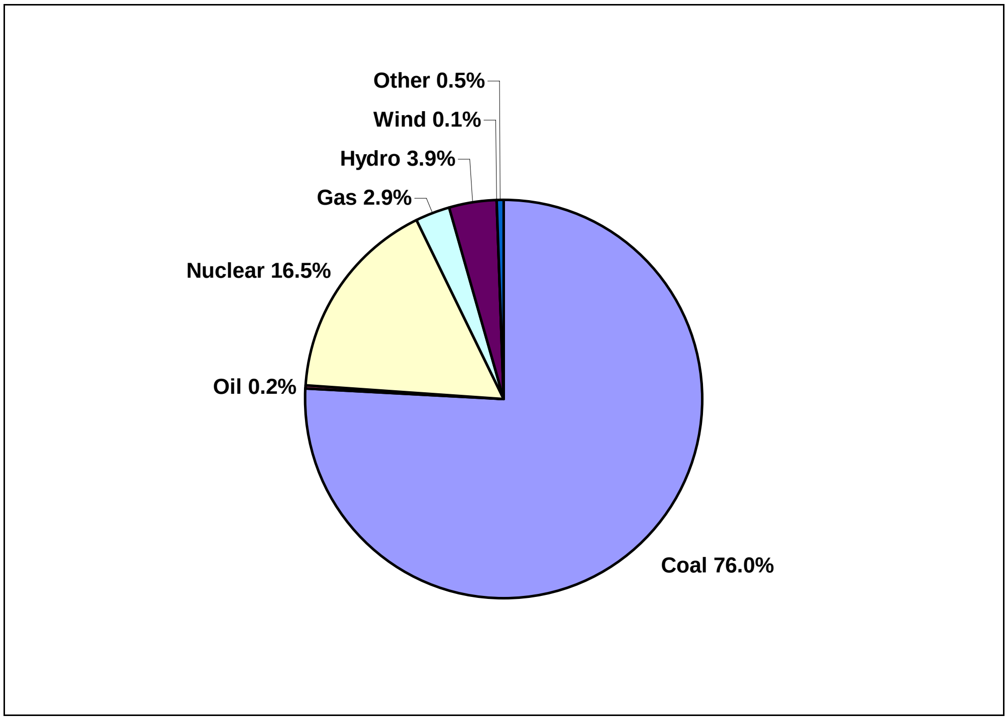
Appalachia's renewable energy resource base contains considerable untapped potential that could be readily used to produce alternative sources of power and fuels. The potential for wind energy in the Region is greatest along the ridgelines of the Appalachian Mountains, although a few states possess considerable wind energy potential on their coastlines. In the case of solar PV, production of residential and commercial PV power is currently viable south of Virginia and Kentucky, and several PV manufacturing plants are located throughout northern Appalachia.[2]

In addition, the industrial base of the Region is competitively well positioned to supply the necessary resources for these energy production and conversion processes.[3] In some cases, regional businesses are already engaged in the production of these emerging

[2] *Energy Efficiency and Renewable Energy in Appalachia: Policy and Potential* by Center on Business and Economic Research, Marshall University.
[3] *Economic Development Potential of Conventional and potential Alternative Sources in Appalachian Counties*, by Dr. Amy Glasmeier, Penn State University, June 21, 2006.

energy technologies, particularly wind turbine components, solar components and photovoltaic panels, biofuel plants, and other components and parts. From an economic development perspective, there are numerous supplier-chain links that could be cultivated among existing businesses to supply other resources for these alternative energy technologies.

Figure 1
Appalachia's Electrical Generation Output by Fuel Source, 2004



Source: Electrical generation data derived from Energy Information Administration, *EIA-860 Database Annual Electrical Generation Report and Electric Power Monthly*.

Appalachian State Policies for Alternative Energy: Recent years have seen comprehensive energy plans either passed or under consideration in many Appalachian states.[4] Specific state policies that have a direct bearing on stimulating renewable energy production and use in various Appalachian states include:

- **Net Metering,** where those who use qualified distributed generators powered by renewable or alternative fuels receive credit or payment for the electricity they produce. Net metering is allowed in North Carolina, Virginia, Maryland, Ohio, Kentucky, New York, Pennsylvania, and Georgia. It is also available through the Tennessee Valley Authority (TVA) in the parts of Tennessee, Mississippi, and

[4] *Energy Efficiency and Renewable Energy in Appalachia: Policy and Potential* by Center on Business and Economic Research, Marshall University.

North Carolina TVA serves. The provisions in these laws vary, including what types of renewables are eligible, what size generators can be used, whether the programs are voluntary or compulsory, what price is paid for the distributed generation, who pays for the installation to the grid, and the total amount of generation a utility must accept.

- **Renewable Energy Portfolio Standards** require that a certain percentage of the power either generated or consumed in a state must come from renewable fuels. The utility is required to either build a renewable energy facility or buy renewable energy from another generator to meet the requirement. New York, Pennsylvania, and Maryland have renewable energy portfolio standards.

  There are differences among the states as to what should be considered "renewable energy." All include solar and wind power, along with small-scale hydropower. Landfill gas is included by most states. Pennsylvania's standard includes waste from wood or coal, as well as demand-side management. Standards are often divided into tiers, with requirements that given percentages must be met by using certain fuels such as solar or wind. While the tiers add complexity to the standards, they are considered desirable because they encourage the development of certain renewables.

  A recent development is the market for renewable energy credits. Under this program, a generator using renewables can meter the amount of energy produced. The producer then sells the renewable energy in one-megawatt credits, which can be can be purchased by a utility to satisfy its renewable-energy requirement.

- **Public Benefit Funds,** which attach a small charge to each customer's monthly energy bill, are used in New York, Ohio, and Pennsylvania. Monies collected under these programs are used in a wide variety of ways, including subsidizing energy efficiency for low-income households; making low-cost loans or grants for the installation of renewable or alternative energy generation; supporting the research and development of renewable, alternative and efficient energy; encouraging the location of renewable-energy related industry in the state; and remediation of impacts from pollution caused by energy generation from conventional fuels.

- **Grant and Loan Programs** are available in all Appalachian states for certain uses. These programs encourage the adoption, installation, and use of alternative or renewable technologies; provide low-cost loans; promote energy efficiency education; assist low-income consumers; finance research and development; locate renewable energy manufacturing; support the use of biofuels; and reward energy conservation. Differences among state programs are considerable and reflect both the priorities and the financial capabilities of the states using them.

- **Tax Incentives** are not as widespread as other inducements, but some Appalachian states grant personal and corporate tax incentives, such as deductions or credits for installing or producing renewable or alternative energy. New York, Maryland, North Carolina, South Carolina, Tennessee, Virginia, and West Virginia provide or allow property-tax exemptions or rate reductions for certain forms of renewable generation or installation. Limited sales tax reductions are also available in Georgia, New York, Maryland, and Ohio for renewable installation.

- **Rebate Programs** are in place in some states, including New York, Maryland, Pennsylvania, South Carolina, and Kentucky. These programs include the installation of solar equipment, the purchase of energy-efficient appliances, and the production and use of alternative fuels.

- **Green Purchasing Programs,** which allow consumers to support the generation of clean energy by paying a slight additional charge, have been established by some states and utilities in the Region.

VIII. Background on the Appalachian Regional Commission

The Appalachian Regional Commission is a federal-state partnership established in 1965 by the Appalachian Regional Development Act to promote economic and social development of the Appalachian Region. The Act, as amended in 2002, defines the Region as 410 counties comprising all of West Virginia and parts of Alabama, Georgia, Kentucky, Maryland, Mississippi, New York, North Carolina, Ohio, Pennsylvania, South Carolina, Tennessee, and Virginia—an area of 200,000 square miles and about 22.9 million people. To promote local planning and implementation of ARC initiatives, the Commission established 72 Local Development Districts (LDDs) comprising groups of counties within each of the 13 states. The Commission has 14 members: the governors of the 13 Appalachian states and a federal co-chairman, who is appointed by the president.

For 42 years, the Commission has funded a wide range of programs in the Region, including highway corridors; community water and sewer facilities and other physical infrastructure; health, education, and human resource development; economic development programs and local capacity building, and leadership development. The rationale for ARC's Area Development program is to provide the basic building blocks that will enable Appalachian communities to create opportunities for self-sustaining economic development and improved quality of life. These strategic goals were agreed upon after an exhaustive, year-long strategic planning process involving federal, state, and local officials and citizens that focused investment in four goal areas:

1. Increase job opportunities and per capita income in Appalachia to reach parity with the nation.
2. Strengthen the capacity of the people of Appalachia to compete in the global economy.

3. Develop and improve Appalachia's infrastructure to make the Region economically competitive.
4. Build the Appalachian Development Highway System to reduce Appalachia's isolation.

Area Development funds are allocated to the states on a formula basis and each state has wide discretion in deploying those resources across the four goal areas based on local needs and state priorities. However, an overarching policy mandated by Congress is that ARC resources are to be targeted to those counties with the greatest needs—those still the farthest behind that are designated as "distressed."

In FY 2007, the Commission's definitions of economic development levels designated 78 counties as distressed because of high rates of poverty and unemployment and low rates of per capita market income compared to national averages; 78 counties are characterized as "at-risk"; 221 counties were designated transitional, with higher than average rates of poverty and unemployment and lower per capita market income; 26 counties have nearly achieved parity with national socioeconomic norms and are now designated as competitive and; 7 counties have reached or exceeded national norms and are now designated as attainment counties. See ARC's web site for more details (http://www.arc.gov/).

IX. Outline of Proposal Contents

A. Technical Proposal.

Please note that the core narrative of the proposal should not exceed 15 pages, (not including the abstract and accompanying longer resumes and boilerplate organizational background materials which should be included as appendices.)

1. ***Summary Abstract (350 words).*** In this section, provide a brief abstract of the technical portion of the proposal by summarizing the background, objectives, proposed methodology, and expected outputs and results of the research.

2. ***Methodology.*** State the step-by-step approach or methods intended to accomplish all the tasks specified in this RFP. The proposal should provide a detailed explanation of the methodologies to be used, describe the limits of the selected methods, and justify why the methods were selected over others. The proposal should identify the points and tasks in this research project that will require participation by the Commission and ARC staff. Further, the statement should identify specific information needs according to sources, procedures, and individual tasks of the research that may need to be supplied by the Commission. Finally, the proposal should identify any difficulties that may be encountered in this project and propose practical and sound solutions to these problems.

3. ***Project Work Plan and Milestones.*** The proposal should describe the phases into which the proposed research can be logically divided and performed together. Flow charts may be included as necessary. A schedule of milestones and deadlines should be specified for the completion of various work elements, including information collection, interviews, surveys, analyses, quarterly progress reports, preliminary drafts for review, and final draft reports.

4. ***Key Personnel.*** Personnel performing the research must be described in this section in terms of numbers of people and their professional classification (e.g., project director, economist, analyst, statistician, etc.). Brief resumes of the education and relevant experience of the principal investigator, co-investigator, and other key personnel are required in the core of the proposal (longer resumes can be included in an appendix). The selected contractor will be required to furnish the services of those identified in the proposal as key personnel. Any change in key personnel is subject to approval by ARC.

B. Management Proposal

The resource capability and program management for planning and performing the research will be considered in the proposal selection process.

1. ***Business Management Organization and Personnel.*** Furnish a brief narrative description of the organization, including the division or branch planned to perform the proposed effort, and the authority responsible for controlling these resources and personnel (longer boilerplate materials can be included in appendix).

2. ***Staffing Plan.*** A staffing plan is required that describes the contractor's proposed staff distribution to accomplish this work. The staffing plan should present a chart that partitions the time commitment of each professional staff member to the project's tasks and schedule. In addition, the proposal should include a detailed description of activities for key project-related personnel and anticipated deliverables. Finally, the proposal should identify the relationship of key project personnel to the contracting organization, including consultants and subcontractors.

3. ***Relevant Prior Experience.*** The proposal must briefly describe the qualifications and experience of the organization and the personnel to be assigned to the project. An appendix can include detailed information on direct experience with the specific subject-matter area and organizations, addresses, contact persons, and telephone numbers for such references.

4. ***Contract Agreement Requirements.*** This section of the proposal should contain any special requirements that the contractor wants to have included in the contract.

C. Cost Proposal

Each proposal submitted must contain all cost information. The cost information should include direct labor costs (consistent with the staffing plan), labor overhead costs, transportation (if anticipated), estimated cost of any subcontracts, other direct costs (such as those for data bases and economic models), university overhead, total direct cost and overhead, and total cost and fee or profit.

In addition, ARC may choose to request that the selected contractor formally present and discuss study findings with key Appalachian officials in Washington, D.C. This activity will be over and above routine meetings with ARC staff during the course of the project, and the contractor should price its part in this activity separately, assuming travel to a one-day meeting.

The contract awarded for this research project will be a FIRM FIXED-PRICE CONTRACT, with payments on a quarterly schedule. The contract terms shall remain firm during the project and shall include all charges that may be incurred in fulfilling the terms of the contract.

X. Sources:

National and State Energy Policy Trends: Appalachian Regional Energy Blueprint Research Brief, by The Keystone Center, Washington DC, August 2006.

Non-Renewable Energy Innovation, Research to Support the Appalachian Energy Initiative, Global Insight Inc. July 30, 2006.

Energy Efficiency and Renewable Energy in Appalachia: Policy and Potential by Center on Business and Economic Research, Marshall University, WV, August 28, 2006. http://www.marshall.edu/cber/research/index.htm

Economic Development Potential of Conventional and potential Alternative Sources in Appalachian Counties, by Dr. Amy Glasmeier, Penn State University, June 21, 2006.

Wind Turbine Development: Location of Manufacturing Activity, Renewable Energy Policy Project. 2004; *Solar PV Development: Location of Economic Activity, Renewable Energy Policy Project. 2005; Component Manufacturing Wisconsin's Future in the Renewable Energy Industry*, Renewable Energy Policy Project, Washington, D.C., 2006 (http://www.crest.org/)